

land lead to higher market prices. This raises feed costs for meat, dairy, and egg producers, who pass through to final consumers a portion of the higher costs. Under current programs, which allow domestic feed grain prices to seek market-clearing levels, these effects likely are minor. For processed food products with large farm-to-retail price spreads, the effects of the program on consumer prices are too small to measure.

Policy Issues and 1995 Farm Legislation

There are many issues raised for 1995 farm bill debates. This section discusses some key issues to be addressed in the feed grains portion of this year's farm legislation and policy options to address these issues.

Some Policy Issues To Be Addressed

Planting Flexibility

The planting flexibility provisions of 1990 farm legislation were designed in part to allow low-productivity feed grain base acres to be planted to alternative crops if the alternatives were more profitable than feed grains. However, planting flexibility is constrained by production practice considerations, such as crop rotations. In addition, deficiency payments play a role in planting decisions on optional flex acres (OFA). While producers' planting decisions on normal flex acres (NFA) are likely based on market net returns and/or rotation considerations (because no deficiency payment is made on NFA and no loss of crop acreage base is a concern), feed grain deficiency payments affect planting decisions on OFA. Also, NFA is primarily a means of reducing payment acreage.

During 1991-94, feed grain flex acres planted to alternative crops were limited. In 1991, the first year the 1990 farm legislation was implemented, of a total potential 20.7 million flex acres (including NFA and OFA) on corn cropland, only 3.0 million acres were planted to soybeans, minor oilseeds, and other non-program crops, or 14 percent of the maximum potential flex acres. Flex acres for all feed grains planted to these crops were 3.6 million acres, of which about 3.1 million acres were planted to soybeans (table 19). The percentage of corn flex acres planted to these crops remained the same in 1992, reflecting comparable soybeans-to-corn expected price ratios in March-April when producers had to make planting decisions. The percentage of corn flex acres planted to these crops increased to 16 percent in 1993 due to an improvement in the expected profitability of soybean plantings relative to corn. In 1994, this percentage increased to 21

percent primarily because the corn ARP was set at 0 percent. During 1991-94, an average of 3.3 million corn flex acres were planted to soybeans, minor oilseeds, and other nonprogram crops, or 16 percent of corn total flex acres.

The switch of plantings from feed grain to alternative crops was limited not only by a lack of economic in-

Table 19—Feed grain flexibility acreage planted to soybeans, minor oilseeds, and other nonprogram crops

| Feed grain/ crop year | Flex acres planted to other crops | | | Total flex acres |
|--------------------------|-----------------------------------|-------------------------------------|-----------------------------------|------------------------|
| | Soy- beans | Minor oil- seeds ¹ | Other non- program crops | |
| <i>Million acres</i> | | | | |
| 1991 | | | | |
| Corn | 2.772 | .029 | .201 | 3.002 |
| Sorghum | .198 | .007 | .057 | .262 |
| Barley | .080 | .065 | .083 | .228 |
| Oats | .081 | .017 | .023 | .121 |
| Feed grains | 3.131 | .118 | .364 | 3.613 |
| 1992 | | | | |
| Corn | 2.652 | .018 | .146 | 2.816 |
| Sorghum | .182 | .003 | .031 | .216 |
| Barley | .076 | .048 | .061 | .185 |
| Oats | .086 | .013 | .018 | .116 |
| Feed grains | 2.995 | .083 | .257 | 3.334 |
| 1993 | | | | |
| Corn | 2.990 | .043 | .146 | 3.179 |
| Sorghum | .233 | .007 | .029 | .269 |
| Barley | .090 | .084 | .073 | .247 |
| Oats | .098 | .020 | .020 | .137 |
| Feed grains | 3.411 | .153 | .268 | 3.832 |
| 1994² | | | | |
| Corn | 4.070 | .048 | .172 | 4.290 |
| Sorghum | .277 | .007 | .032 | .317 |
| Barley | .100 | .096 | .090 | .286 |
| Oats | .099 | .019 | .020 | .138 |
| Feed grains | 4.546 | .170 | .314 | 5.030 |

¹Includes canola, flaxseed, mustard seed, safflower, and rapeseed.

²Based on preliminary compliance figures.

Source: Consolidated Farm Service Agency (formerly Agr. Conserv. and Stab. Serv.), U.S. Dept. Agr.

centives for making the switch but also by production practice considerations, such as the corn-soybeans crop rotation.

Because the corn-soybeans crop rotation is common in the Corn Belt, producers are reluctant to plant NFA to alternative crops unless the increase in profitability from switching the plantings exceeds the potential benefit of the crop rotation. The extent to which corn OFA were planted to soybeans, given expected corn and soybean yields and variable costs, depends critically on (1) the soybeans-to-corn expected price ratio in March-April when planting decisions have to be made, and (2) the level of ARP requirement in the corn program. During 1991-94, the soybeans-to-corn expected price ratios (based on the December corn futures price and the November soybean futures price) were either below the breakeven price ratio (around 2.4-2.6 to 1) or within the low end of the breakeven price ratio range (table 20). The corn program distorts the net returns relationship between corn and soybean production by providing deficiency payments on OFA to corn producers participating in the program. A higher corn flex acreage (3.0 million acres) was planted to soybeans in 1993 due partly to a higher soybeans-to-corn price ratio (2.47 to 1, up from 2.33 to 1 in 1992). National prices and costs, however, can only indicate what to expect in general about the extent of flex acres that would likely be planted to alternative crops; individual producers base their planting decisions on what can be expected on their farms. In 1994, corn flex acres planted to soybeans reached 4.1 million acres primarily due to a 0-percent set-aside which makes more marginal corn land available for plantings to alternative crops.

Prospects of planting flexibility in the 1995 crop year and beyond are somewhat uncertain and, in fact, might meet with more restrictions. The 7.5-percent set-aside requirement for the 1995 corn program would make less corn land available for planting to alternative crops. In addition, recent market developments suggest that it is unlikely the soybeans-to-corn price ratio

in March-April of 1995 will greatly surpass the 2.45 to 1 ratio of 1994. Perhaps even more important, starting January 1, 1995, all conservation plans are required to be fully implemented on highly erodible land before a producer is eligible for farm program benefits. These conservation plans, such as crop rotations, will place more restrictions on year-to-year changes in cropping patterns.

Acreage Idling

Concerns have been raised recently by some policy-makers and many grain handlers, exporters and end-users about the wisdom of idling large acres of program commodities through annual set-aside (ARP), 50/92, 0/85-92, and long-term CRP. Some critics suggest that idling cropland acreage through supply control tends to raise average costs of production and export prices, lower farm income, and weaken U.S. competitiveness on the international market. Critics also point out that much land in CRP is suited for crop production. According to a survey conducted by the Soil and Water Conservation Society (SWCS) in late 1993, CRP contract holders intended to return 63 percent of their acres to crop production, including idling these acres to meet ARP, 50/92, and 0/85-92 requirements, or leasing these acres to other farmers (Osborn, Schnepf, and Keim). If this occurs, expiration of CRP contracts could return about 22.8 million acres to crop production out of the existing 36.4 million acres in CRP contracts. Of the 22.8 million acres in expiring CRP contracts, 23.6 percent (or 5.4 million acres) could return to feed grain production.

Since 1991, feed grain programs and CRP idled an average of 22 million acres per year, about 20 percent of the feed grain base acreage. This magnitude of idled acreage, although smaller than the 25 percent of feed grain base idled during 1986-90, will be subject to policy debates in light of expected growth in future exports.

The foregoing viewpoint must be tempered by concerns over the high cost of farm programs stemming from a

Table 20—Corn flex acres planted to soybeans, set-aside, and soybeans-to-corn, 1991-94

| Year | Acres flexed to soybeans | Corn set-aside | Dec. corn futures price in Mar.-Apr. | Nov. soybean futures price in Mar.-Apr. | Soybeans-to-corn price ratio |
|------|--------------------------|----------------|--------------------------------------|---|------------------------------|
| | <i>Million acres</i> | <i>Percent</i> | <i>-----Dollars/bushel-----</i> | | |
| 1991 | 2.772 | 7.5 | 2.62 | 6.18 | 2.36 to 1 |
| 1992 | 2.652 | 5.0 | 2.61 | 6.08 | 2.33 to 1 |
| 1993 | 2.990 | 10.0 | 2.43 | 6.01 | 2.47 to 1 |
| 1994 | 4.070 | 0 | 2.60 | 6.36 | 2.45 to 1 |

low- or no-acreage idling. Under a low-acreage idling scenario, farm program costs would escalate as a result of larger payment acreages and higher deficiency payment rates. Even with the current acreage-idling, farm programs already cost \$16 billion in fiscal 1993 and an estimated \$12 billion in fiscal 1994. The cost of farm programs would have skyrocketed to a much higher level had acreage-idling programs been removed. Thus, the acreage-idling issue must be addressed by recognizing the tradeoff between the desire of enhancing U.S. competitiveness on the world market and the need of keeping the cost of farm programs under control because the 1995 Farm Bill will be driven by budget constraints. Also, debates over acreage idling must recognize that acreage idling supports farm prices and is favored by many grain producers.

Acreage Reduction Program, 50/92, and 0/85-92.

Since 1991, feed grain acres idled under annual set-asides (including ARP, 50/92, and 0/85-92) averaged about 12 million acres per year, or 10 percent of feed grain base acreage. The ARP adjusts supply and demand imbalances by requiring that a certain percentage of producers' crop base acreage be set aside from production. However, an unduly large set-aside raises costs of production and export prices and thus weakens U.S. competitiveness on the world market. Set-aside is also the primary source of economic inefficiency (deadweight loss) in income transfer from taxpayers and consumers to producers. Also, the 50/92 and 0/85-92 provisions, which became popular beginning in the late 1980's, at times could work against their intent of supply control. These measures helped to reduce excessive feed grain ending stocks from 133.6 million metric tons in 1987/88 to 65.9 million in 1988/89, although the reduction was primarily achieved by droughts. Corn ending stocks were also reduced from 4.26 billion bushels in 1987/88 to 1.93 billion in 1988/89. However, in times when there is a production shortfall or stocks are tight relative to use, these measures could worsen the tight supply situation.

Conservation Reserve Program. What to do with expiring CRP contracts has become a contentious policy issue for 1995 farm bill debates. The issues revolve around budget outlays, environmental impacts, and the market effects of continuing to withhold acreage from production.

Current enrollment in CRP stands at 36.4 million acres, very close to the 38-million-acre target set by the OBRA of 1993. About 11 million acres of feed grain acres were enrolled in CRP in 1994, accounting for 10 percent of feed grain base acreage (table 21). Expiration of CRP contracts raises concerns about loss of the conservation and wildlife benefits that have been gained from the CRP, especially if commodity markets are favorable in 1996 and 1997 when the bulk of CRP contracts expire. However, critics suggest that CRP is very costly even though the program is credited with being effective in reducing soil erosion and in achieving other conservation and wildlife benefits. Annual rental payments average \$50 per acre, with an annual \$1.8 billion Federal Government outlay (Osborn and Heimlich).

In addition, some cropland in CRP is reported to be not highly erodible. Twenty-six percent of CRP acres were reported to have an erodibility index (EI) of less than 8, placing it in the least erodible land category, which requires no conservation compliance (Heimlich and Osborn). And of that land in the CRP that has an EI of 8 or more, only about half falls in the most erodible category. The percentage of land that is not highly erodible in CRP contracts might actually be even higher. According to USDA's Natural Resources Conservation Service (formerly Soil Conservation Service) 1992 National Resources Inventory database, 41 percent of acres in CRP contracts were not highly erodible cropland (Kellogg, TeSelle, and Goebel). Critics of CRP suggest that erosion control can be obtained at much lower cost than under the current CRP and that, instead of focusing on soil erosion control,

Table 21—Feed grain acres idled under long-term CRP

| Crop | 1986 | 1987 | 1988 | 1989 | 1990 | 1991 | 1992 | 1993 | 1994 |
|---------|----------------------|------|------|------|------|------|------|------|------|
| | <i>Million acres</i> | | | | | | | | |
| Corn | .2 | 2.3 | 2.8 | 3.4 | 3.8 | 3.9 | 4.1 | 4.3 | 4.3 |
| Sorghum | .2 | 1.2 | 1.9 | 2.2 | 2.4 | 2.4 | 2.4 | 2.5 | 2.5 |
| Barley | .1 | 1.1 | 1.9 | 2.4 | 2.7 | 2.8 | 2.8 | 2.8 | 2.8 |
| Oats | .1 | .5 | .9 | 1.1 | 1.3 | 1.3 | 1.4 | 1.4 | 1.4 |
| Total | .6 | 5.1 | 7.4 | 9.0 | 10.2 | 10.3 | 10.6 | 11.0 | 11.0 |

CRP should be extended to preserve water quality and protect fish and wildlife habitats.

Finally, in light of expected demand growth for U.S. feed grains, critics suggest that the CRP should focus narrowly on the highly erodible cropland and return a good portion of cropland in CRP to production. About 5.4 million acres out of the existing CRP contracts, as indicated earlier, could return to feed grain plantings.

Malting Barley Assessment

USDA recently announced that it will reduce the assessments on 1994- and 1995-crop malting barley to 0 percent. This announcement removed earlier concerns about implementing the malting barley assessment. Nonetheless, until Congress dismantles this provision, the barley assessment remains structurally part of the 1990 farm legislation. Furthermore, even if the U.S. Department of Agriculture continues a 0-percent barley assessment, critics suggest that this leaves nothing to offset the higher program cost resulting from the use of the feed barley price exclusively for calculating deficiency payments rather than including both feed and malting barley prices in the payment calculation.

Concerns were raised in recent years about implementing the malting barley assessment. Critics of the malting barley assessment believe that the assessment raises costs of producing and marketing malting barley, which could contribute to the decline of acreage planted to malting barley. Producers, particularly in the Midwest, in the interest of avoiding the assessment, may switch barley marketing away from malt use to feed, which would result in lower feed barley prices and higher deficiency payments. The assessment could make U.S. malting barley producers less competitive than Canadian producers. Finally, the assessment requires additional paperwork and adds administrative complexity.

Section 401 of the FACTA of 1990 requires the U.S. Department of Agriculture to implement an assessment for each of the 1991 through 1995 crop years to be levied on producers of malting barley who participate in the program. The assessment is to be no more than 5 percent of the value of malting barley produced on the farm. The assessment is deducted from deficiency payments for producers of malting barley. If malting barley sales are not certified by producers to be less than their payment production (program yield times payment acres), the entire payment production will be assessed. The legislative intent of the assessment was to partially offset higher program costs associated

with using the feed barley price to determine barley deficiency payments.

Only malting barley receiving deficiency payments produced on payment acres is subject to the assessment. Those bushels were assessed at 5 percent of the State or national (if a State price is not available) average malting barley price received by producers during the first 5 months of the marketing year, as reported by NASS-USDA, prior to the end of 1993 but reduced to 2.5 percent afterward, and more recently, 0 percent.

This 0-percent barley assessment, however, raises an issue about the deficiency payment calculation for barley. According to 1990 farm legislation, the target price for barley cannot be less than 85.8 percent of the target price for corn. This relative target price relationship implies that the barley target price factors in both barley's feed and malt values, because barley's feed value is only 77 percent of corn's, bushel for bushel. However, barley's deficiency payments, as they currently stand, are based on the difference between the target price and the first 5-month feed barley market prices. Until USDA's announcement of 0-percent barley assessment, the larger payment rate as a result of excluding malting barley in the first 5-month barley market prices calculation was partially offset by the barley assessment. With a 0-percent barley assessment, critics suggest that this leaves nothing to offset the higher program cost resulting from the use of feed barley price exclusively in calculating the first 5-month barley market prices. As a result, the barley program cost will be higher than that obtained from including both feed and malting barleys in calculating the first 5-month barley market prices for determining the barley deficiency payment rate.

Effects of GATT and NAFTA on the Feed Grain Sector

The Uruguay Round Agreement of GATT (the General Agreement on Tariffs and Trade) and the North American Free Trade Agreement (NAFTA) promise to raise global income and thus help boost U.S. agricultural exports. Feed grains are an important component of this anticipated export growth because feed grain exports tend to be responsive to income growth which, in turn, would benefit U.S. feed grain producers. NAFTA and the Uruguay Round Agreement of GATT would have important implications for the policy issues to be addressed in the 1995 farm bill debates.

The Uruguay Round Agreement of GATT

No major changes in world coarse grain markets are anticipated as a result of the Uruguay Round Agreement of GATT. The most important effect is expected to be increased global income. This will support increased demand for meat and livestock products and import demand for feed grains. Latin America (including Mexico), Asia, and North Africa are all expected to increase imports significantly as incomes rise. Although these market developments are likely to take place regardless of the Uruguay Round Agreement, the Agreement will likely reinforce the increase in potential coarse grain imports by these countries.

NAFTA

The North American Free Trade Agreement (NAFTA), signed by the United States, Canada, and Mexico at the end of 1992 and ratified by the U.S. Congress in late 1993, is expected to have a significant effect on U.S. feed grain (especially corn) exports to Mexico, U.S. agriculture's third largest export market. According to a recent USDA study, at the end of the 15-year transition period, annual U.S. corn exports to Mexico are expected to increase by 60 percent from the level that would have been expected had there been no NAFTA, reaching 6 million metric tons. This export level would double the (average) 2.9 million tons of U.S. corn exports during 1989-91. An early assessment of NAFTA indicated that the value of U.S. grain and feed (mostly feed grain) exports to Mexico in January-July 1994 was up 10 percent from the same period in 1993 (ERS-USDA).

Corn exports to Mexico are expected to grow under NAFTA as corn tariffs decline and the quota increases, and as Mexican meat consumption rises with stronger income growth. NAFTA assures the United States a 2.5-million-metric-ton duty-free access for corn in calendar year 1994 that will increase by 3 percent each year. Mexico's 215-percent over-quota tariff for corn will be reduced by 24 percent in the first 6 years, then phased out in the following 9 years. Tariffs on other coarse grains will be phased out at more rapid rates and imports will expand accordingly.

The composition of Mexican coarse grain imports will depend on the relative prices of U.S. coarse grains and, at least initially, may cause some substitution of sorghum with corn. After an initial drop, U.S. exports of grain sorghum are also expected to grow as a result of greater Mexican demand for livestock feed, fueled by income growth and lower grain prices in Mexico. A weaker peso and a troubled Mexican economy, however, could slow growth in imports, at least in the short run.

Policy Options

Planting Flexibility

The planting flexibility provision of 1990 farm legislation achieved the switch of an average of 4.0 million acres from feed grain flex acres to plantings of alternative crops during 1991-94. This amounted to 16 percent of maximum flex acres that potentially could be planted to alternative crops.

An option to cut program costs while permitting planting flexibility is to expand the normal flex acreage from the current 15 percent to a higher level, but leave the additional 10-percent optional flex acreage intact. Thus, producers would be allowed greater planting flexibility without worrying about losing their crop base acreage. This option would provide producers with more flexibility and could be an effective means of alleviating restrictions placed by conservation plans for highly erodible land on changes in year-to-year cropping patterns. In addition, this option would also achieve savings in Government costs, as payment acres would be reduced further.

Critics of this option, however, argue that increasing the percentage of normal flex acreage may not actually make much difference in plantings of corn flex acres to soybeans, minor oilseeds, and other nonprogram crops. They contend that adding more NFA will mainly increase program crop planting on flex acres. OFA planted to alternative crops will remain limited as long as the corn program is in place and the soybeans-to-corn expected price ratio in March-April is below the 2.4-2.6 to 1 breakeven price ratio, or the ARP is set at a higher level.

An alternative to the first option is to combine all crop acreage bases into a farm program base and allow complete planting flexibility within the base. No restriction is imposed on planting to any single program crop. Farm program benefits would be extended to a specific percentage of the new program base. An obvious advantage of this alternative is that it allows producers complete planting flexibility in choosing crops to be planted on their program base acreage. This flexibility would be of special significance if soybeans are also included, since soybeans are the major competing crop in the Corn Belt. Producers are free to select crops to be planted on the program base acreage by growing crops that would provide them with the highest net returns (market receipts plus Government payments minus variable costs of production). Opponents to this alternative, however, contend that the program base acreage offers flexibility at the expense of controlling supply and demand imbalances

for specific commodities. The acreage reduction program (ARP), which is commodity-specific, would be replaced by a set-aside concept that is not commodity-specific. Cotton producers are especially concerned over how much sorghum and wheat land could be planted to cotton, because expanded cotton acreage would depress cotton prices. Also, corn acres planted to alternative crops may not increase because there is no acreage base for soybeans.

A third alternative is to implement a normal crop acreage (NCA) concept, such as the one under the 1977 farm legislation, where the planting restriction required that planted acres plus the acreage set aside for specific program crops could not exceed the farm's NCA. Thus, acres planted to a program crop depended not only on that program crop's set-aside requirement, but also on acres planted to other program crops and their set-aside requirements. No restriction is imposed on planting of a single program crop. This alternative offers planting flexibility without losing control of supply and demand balances for specific commodity crops. Set-asides for individual program crops can still be set according to the stocks-to-use ratio, the same as in the current farm legislation.

Acreage Idling

The pressure of curtailing farm program costs tends to raise the annual set-aside level as a means of reducing the payment acreage and lowering the payment rate. However, some critics contend that a higher set-aside raises costs of production and weakens U.S. competitiveness on the international market. Prospects of hindering U.S. competitiveness on the world market are of special concern to the U.S. feed grain industry in light of expected growth of U.S. corn and feed grain exports.

An option is to minimize the annual set-aside requirement and to reduce the extent of Government payment under the now 0/85-92 provision, or simply eliminate the 50/92 or 0/85-92 programs. The mechanism of set-aside will still be in place and the level will continue to be linked to the stocks-to-use ratio, but the minimum ARP will be set at a lower level than specified in the 1990 farm legislation. This option will minimize any undesirable effects on U.S. competitiveness in the world market due to a high set-aside level. However, this option could significantly increase feed grain program costs and thus increase taxpayers' burden in financing feed grain programs, compared with current programs. Similarly, reducing the extent of Government payment under the current 0/85-92 provision, such as reducing the percentage of payment from the current 85-92 percent to an even lower per-

centage, would alleviate concerns over the undesirable consequence of the program when supply is tight. A more drastic option is to eliminate the 50/92 or 0/85-92 program entirely. A drawback of these alternatives is that excess production, if it occurs, cannot be brought under control faster in the absence of the 50/92 or 0/85-92 program. Also, eliminating the 50/92 or 0/85-92 program would remove some major benefits perceived by producers, including (1) the support of market prices received by producers, (2) protection of base acreage by devoting all or a portion of permitted acreage to conserving uses and receiving 85-92 percent of projected deficiency payments, and (3) payments to high-cost producers who devote all of permitted acreage to conserving uses.

CRP promises to be one of the core issues in the 1995 farm bill debates. On August 24, 1994, former Secretary Espy announced that producers having CRP contracts expiring on September 30, 1995, would have the option to extend those contracts for 1 year at the same rental rates. However, cropland in these CRP contracts expiring in 1995 amounts to only slightly more than 2 million acres; the bulk of the CRP contracts do not expire until 1996-99. Also, the extension is temporary. On December 14, 1994, the Secretary announced further extensions and adjustments to the program. Among the provisions are the option for early termination of contracts or reductions in the amount of acreage in the CRP. New opportunities for enrollment will also be available but under stricter environmental and conservation criteria. All participants will also be given the opportunity to modify and extend their contracts upon maturity starting in 1996, for another 10 years for contracts entered into prior to November 28, 1990, and for 5 years for contracts entered after this date.

This essentially would reauthorize the current CRP program for another 10-15 years, but under more critical criteria. The program will continue to retire a large number of acres from production at high costs, but it attempts to shift much of the cropland in CRP to the most environmentally sensitive land. This approach would be less costly than a simple extension of the CRP with no modifications. It may be more effective in protecting erodible cropland against soil and wind erosion, and preserving water quality and other environmental benefits. Direct Government costs of this modified CRP program are expected to be lower than the current program.

At the other extreme would be terminating the program altogether so that expiring contracts are not renewed. Consideration of this approach provides a

useful alternative scenario for analysis. This would result in raising crop acreage, although not all of the nearly 11 million acres of feed grain acres would return to production, and even less to field crop production. It would raise production, and thus reduce prices. The implications of this option would include higher deficiency payment outlays and the potential for higher ARP's, while there would also be savings in CRP expenditures. It would likely mean lower feed grain prices for domestic users and importers. However, there would also be harmful environmental effects to the degree marginal and environmentally sensitive cropland returns to production.

Malting Barley Assessment

As noted earlier, the legislative intent of the malting barley assessment was to partially offset higher program costs associated with using the feed barley price to determine the barley deficiency payment. Higher program costs are a result of using both malt and feed values of barley in determining barley's target price relative to corn, but only the feed value in determining the first 5-month market prices. Thus, the malting barley assessment is a means of offsetting higher program costs caused by this seemingly inconsistent calculation for determining barley deficiency payments.

An alternative to the current barley assessment is to eliminate the up-to-5-percent assessment of the malting barley price received by producers during the first 5 months of the marketing year, but then factor in both malt and feed values of barley in determining the first 5-month market prices or the loan rate. Under this option, all the concerns about barley assessment would disappear, no additional paperwork would be required, and no administrative complexity will be added. Finally, barley program costs will be lower as a result of using a consistent approach in determining barley deficiency payments and the first 5-month market prices. However, this would imply lower payments for producers.

Additional Readings

Bowers, D. E., W. D. Rasmussen, and G. L. Baker. *History of Agricultural Price-Support and Adjustment Programs, 1933-84*. AIB-485. U.S. Dept. Agr., Econ. Res. Serv., Dec. 1984.

Collins, K., and L. Salathe. *The 1990 Farm Act and the 1990 Budget Reconciliation Act*. Misc. Publication No. 1489. U.S. Dept. Agr., Econ. Res. Serv., Dec. 1990.

Heimlich, R. E., and C. T. Osborn. "The Conservation Reserve Program: What Happens When Contracts Expire?" *Choice*, third quarter: 9-14, 1993.

Jenkins, J. E., and W. D. McBride. *Characteristics and Production Costs of U.S. Grain Sorghum Farms, 1990*. AIB-661. U.S. Dept. Agr., Econ. Res. Serv., Feb. 1993.

Kellogg, R. L., G. W. TeSelle, and J. J. Goebel. "Highlights from the 1992 National Resources Inventory," *Journal of Soil and Water Conservation*, 49 (6): 521-527, Nov.-Dec. 1994.

Lin, W., C. Z. Lin, and M. Leath. *Costs and Benefits of Cleaning Corn: Overview and Implications*. AER-688. U.S. Dept. Agr., Econ., Res. Serv., June 1994.

McBride, W. D. *Characteristics and Production Costs of U.S. Corn Farms, 1991*. AIB-691. U.S. Dept. Agr., Econ. Res. Serv., Jan 1994.

Mercier, S. *Corn: Background for 1990 Farm Legislation*. Staff Report No. 89-47. U.S. Dept. Agr., Econ. Res. Serv., Sept. 1989.

_____. *The Role of Quality in Corn Import Decision-making*. AER-684. U.S. Dept. Agr., Econ. Res. Serv., June 1994.

Osborn, C. T., M. Schnepf, and R. Keim. *The Future Use of Conservation Reserve Program Acres: A National Survey of Farm Owners and Operators*. Soil and Water Conservation Society. 1994.

U.S. Department of Agriculture. *Effects of the North American Free Trade Agreement on U.S. Agricultural Commodities*. Office of Economics, Mar. 1993.

U.S. Department of Agriculture. *NAFTA: An Early Assessment*. Econ. Res. Serv., Oct. 1994.

_____. *Feed: Situation and Outlook Yearbook*. FDS-330. Econ. Res. Serv., Oct. 1994.

_____. *World Agricultural Supply and Demand Estimates*. WASDE-298. World Agricultural Outlook Board. Jan. 12, 1995.

_____. *Effects of the Uruguay Round Agreement on U.S. Agricultural Commodities*. GATT-1. Office of Economics and Econ. Res. Serv., Mar. 1994.

_____. *Crop Production: Annual Summary*. Nat. Agr. Stat. Serv. Selected issues.



Appendix Tables

1. Acreage, yield, and production of corn, 1965-94
2. Use and ending stocks for corn, 1965-94
3. Prices and ending stocks for corn, 1965-94
4. Program costs for corn, 1965-93
5. Value comparisons for corn, 1965-94
6. World production, consumption, exports, and ending stocks for corn, 1965-94
7. U.S. and world production, trade, and ending stocks of corn, 1970-94
8. Selected ratios: World corn trade, stocks, and consumption, 1965-94
9. Corn production and exports, major foreign exporters and total foreign, 1970-94
10. Production, use, and ending stocks for sorghum, 1965-94
11. Prices and ending stocks for sorghum, 1965-94
12. Program costs for sorghum, 1965-93
13. U.S. and world production, consumption, trade, and ending stocks of sorghum, 1970-94
14. Production, use, and ending stocks for barley, 1965-94
15. Prices and ending stocks for barley, 1965-94
16. Program costs for barley, 1965-93
17. U.S. and world production, consumption, trade, and ending stocks of barley, 1970-94
18. Barley production and exports, major foreign exporters and total foreign, 1970-94
19. Production, use, and ending stocks for oats, 1965-94
20. Prices and ending stocks for oats, 1965-94
21. Program costs for oats, 1965-93
22. U.S. and world production, consumption, trade, and ending stocks of oats, 1970-94

Appendix table 1--Acreage, yield, and production of corn, 1965-94

| Crop year | Planted | Harvested | Diverted ¹ | Yield | Production |
|-------------------|-------------------------|-----------|-----------------------|----------|------------|
| | -----Million acres----- | | | Bu./acre | Mil. bu. |
| 1965 | 65.2 | 55.4 | 24.0 | 74.1 | 4,103 |
| 1966 | 66.3 | 57.0 | 23.7 | 73.1 | 4,168 |
| 1967 | 71.2 | 60.7 | 16.2 | 80.1 | 4,860 |
| 1968 | 65.1 | 56.0 | 25.4 | 79.5 | 4,450 |
| 1969 | 64.3 | 54.6 | 27.2 | 85.9 | 4,687 |
| 1970 | 66.9 | 57.4 | 26.1 | 72.4 | 4,152 |
| 1971 | 74.2 | 64.1 | 14.1 | 88.1 | 5,646 |
| 1972 | 67.1 | 57.5 | 24.4 | 97.0 | 5,580 |
| 1973 | 72.3 | 62.1 | 6.0 | 91.3 | 5,671 |
| 1974 | 77.9 | 65.4 | -- | 71.9 | 4,701 |
| 1975 | 78.7 | 67.6 | -- | 86.4 | 5,841 |
| 1976 | 84.6 | 71.5 | -- | 88.0 | 6,289 |
| 1977 | 84.3 | 71.6 | -- | 90.8 | 6,505 |
| 1978 | 81.7 | 71.9 | 6.1 | 101.0 | 7,268 |
| 1979 | 81.4 | 72.4 | 2.9 | 109.5 | 7,928 |
| 1980 | 84.0 | 73.0 | -- | 91.0 | 6,639 |
| 1981 | 84.1 | 74.5 | -- | 108.9 | 8,119 |
| 1982 | 81.9 | 72.7 | 2.1 | 113.2 | 8,235 |
| 1983 | 60.2 | 51.5 | 32.2 | 81.1 | 4,174 |
| 1984 | 80.5 | 71.9 | 3.9 | 106.7 | 7,672 |
| 1985 | 83.4 | 75.2 | 5.4 | 118.0 | 8,875 |
| 1986 | 76.6 | 68.9 | 14.5 | 119.4 | 8,226 |
| 1987 | 66.2 | 59.5 | 25.4 | 119.8 | 7,131 |
| 1988 | 67.7 | 58.3 | 23.3 | 84.6 | 4,929 |
| 1989 | 72.2 | 64.7 | 14.2 | 116.3 | 7,532 |
| 1990 | 74.2 | 67.0 | 14.5 | 118.5 | 7,934 |
| 1991 | 76.0 | 68.8 | 11.3 | 108.6 | 7,475 |
| 1992 | 79.3 | 72.1 | 9.4 | 131.5 | 9,477 |
| 1993 | 73.2 | 62.9 | 15.2 | 100.7 | 6,336 |
| 1994 ² | 79.2 | 72.9 | 6.7 | 138.6 | 10,103 |

-- = Not applicable (aspect of programs not in effect).

¹ Includes acres diverted under ARP, PLD, PIK, 50/92, 0/85-92, and CRP.

² Projection as of Jan. 12, 1995.

Source: *Feed Situation and Outlook Report*. U.S. Dept. Agr., Econ. Res. Serv., various issues.
World Agricultural Supply and Demand Estimates. U.S. Dept. Agr., WASDE-298, Jan. 12, 1995.

Appendix table 2--Use and ending stocks for corn, 1965-94

| Crop year | Feed and residual | Food, seed, and industrial | Exports | Total use ¹ | Ending stocks | Stocks-to-use ratio |
|---------------------------|-------------------|----------------------------|---------|------------------------|---------------|---------------------|
| | | | | | | Percent |
| -----Million bushels----- | | | | | | |
| 1965 | 3,362 | 360 | 659 | 4,409 | 842 | 19.0 |
| 1966 | 3,333 | 364 | 478 | 4,184 | 826 | 20.0 |
| 1967 | 3,524 | 362 | 612 | 4,519 | 1,168 | 26.0 |
| 1968 | 3,607 | 359 | 524 | 4,501 | 1,118 | 25.0 |
| 1969 | 3,825 | 365 | 612 | 4,801 | 1,005 | 21.0 |
| 1970 | 3,593 | 385 | 506 | 4,495 | 666 | 15.0 |
| 1971 | 3,982 | 409 | 782 | 5,187 | 1,127 | 22.0 |
| 1972 | 4,292 | 450 | 1,242 | 6,000 | 708 | 12.0 |
| 1973 | 4,181 | 472 | 1,230 | 5,896 | 484 | 8.0 |
| 1974 | 3,180 | 497 | 1,149 | 4,826 | 361 | 7.0 |
| 1975 | 3,582 | 521 | 1,664 | 5,767 | 633 | 11.0 |
| 1976 | 3,602 | 542 | 1,645 | 5,789 | 1,136 | 20.0 |
| 1977 | 3,730 | 582 | 1,896 | 6,207 | 1,436 | 23.1 |
| 1978 | 4,274 | 609 | 2,113 | 6,995 | 1,710 | 24.4 |
| 1979 | 4,563 | 640 | 2,402 | 7,604 | 2,034 | 26.8 |
| 1980 | 4,232 | 659 | 2,391 | 7,282 | 1,392 | 19.1 |
| 1981 | 4,245 | 733 | 1,997 | 6,975 | 2,537 | 36.4 |
| 1982 | 4,573 | 855 | 1,821 | 7,249 | 3,523 | 48.6 |
| 1983 | 3,876 | 930 | 1,886 | 6,693 | 1,006 | 15.0 |
| 1984 | 4,115 | 1,067 | 1,850 | 7,032 | 1,648 | 23.4 |
| 1985 | 4,114 | 1,153 | 1,227 | 6,494 | 4,040 | 62.2 |
| 1986 | 4,669 | 1,224 | 1,493 | 7,385 | 4,882 | 66.1 |
| 1987 | 4,798 | 1,243 | 1,716 | 7,757 | 4,259 | 54.9 |
| 1988 | 3,941 | 1,293 | 2,026 | 7,260 | 1,930 | 26.6 |
| 1989 | 4,396 | 1,356 | 2,368 | 8,120 | 1,344 | 16.6 |
| 1990 | 4,663 | 1,373 | 1,725 | 7,761 | 1,521 | 19.6 |
| 1991 | 4,877 | 1,454 | 1,584 | 7,915 | 1,100 | 13.9 |
| 1992 | 5,296 | 1,511 | 1,663 | 8,471 | 2,113 | 24.9 |
| 1993 | 4,704 | 1,588 | 1,328 | 7,620 | 850 | 11.1 |
| 1994 ² | 5,650 | 1,700 | 1,950 | 9,300 | 1,658 | 17.8 |

Note: Crop year begins Sept. 1 for 1976-94, and Oct. 1 for 1965-75.

¹Total may not add due to rounding.

²Projection as of Jan. 12, 1995.

Source: *Feed Situation and Outlook Yearbook*. U.S. Dept. Agr., Econ. Res. Serv., FDS-330, Oct. 1994.
World Agricultural Supply and Demand Estimates. U.S. Dept. Agr., WASDE-298, Jan. 12, 1995.

Appendix table 3--Prices and ending stocks for corn, 1965-94

| Crop year | Ending stocks | | | | Price received | Loan rate | Target price | Direct payment |
|-------------------|---------------------------|------------------|-------|--------------------|------------------------------|-------------------|--------------|----------------|
| | CCC | FOR ¹ | Free | Total ² | | | | |
| | -----Million bushels----- | | | | -----Dollars per bushel----- | | | |
| 1965 | 249 | 280 | 313 | 842 | 1.16 | 1.05 | 1.25 | 0.20 |
| 1966 | 139 | 176 | 511 | 826 | 1.24 | 1.00 | 1.30 | .30 |
| 1967 | 182 | 296 | 690 | 1,168 | 1.03 | 1.05 | 1.35 | .30 |
| 1968 | 295 | 350 | 473 | 1,118 | 1.08 | 1.05 | 1.35 | .30 |
| 1969 | 255 | 293 | 457 | 1,005 | 1.16 | 1.05 | 1.35 | .30 |
| 1970 | 30 | 203 | 433 | 666 | 1.33 | 1.05 | 1.35 | .30 |
| 1971 | 47 | 515 | 565 | 1,127 | 1.08 | 1.05 | 1.35 | .32 |
| 1972 | 40 | 48 | 620 | 708 | 1.57 | 1.05 | 1.41 | .40 |
| 1973 | 4 | -- | 480 | 484 | 2.55 | 1.05 | 1.64 | .32 |
| 1974 | 3 | -- | 358 | 361 | 3.02 | 1.10 | 1.38 | 0 |
| 1975 | 0 | -- | 633 | 633 | 2.54 | 1.10 | 1.38 | 0 |
| 1976 | 0 | -- | 1,136 | 1,136 | 2.15 | 1.50 | 1.57 | 0 |
| 1977 | 4 | 212 | 1,220 | 1,436 | 2.02 | 2.00 | 2.00 | 0 |
| 1978 | 101 | 585 | 1,024 | 1,710 | 2.25 | 2.00 | 2.10 | .03 |
| 1979 | 260 | 670 | 1,104 | 2,035 | 2.48 | 2.10 | 2.20 | 0 |
| 1980 | 242 | 0 | 1,150 | 1,392 | 3.12 | 2.25 | 2.35 | 0 |
| 1981 | 280 | 1,276 | 981 | 2,537 | 2.47 | 2.40 | 2.40 | 0 |
| 1982 | 1,143 | 1,890 | 490 | 3,523 | 2.55 | 2.55 | 2.70 | .15 |
| 1983 | 202 | 447 | 359 | 1,006 | 3.21 | 2.65 | 2.86 | 0 |
| 1984 | 225 | 389 | 1,034 | 1,648 | 2.63 | 2.55 | 3.03 | .43 |
| 1985 | 546 | 711 | 2,783 | 4,040 | 2.23 | 2.55 | 3.03 | .48 |
| 1986 | 1,443 | 1,498 | 1,941 | 4,882 | 1.50 | 1.92 ⁴ | 3.03 | 1.11 |
| 1987 | 835 | 1,127 | 2,297 | 4,259 | 1.94 | 1.82 | 3.03 | 1.09 |
| 1988 | 362 | 724 | 844 | 1,930 | 2.54 | 1.77 | 2.93 | .36 |
| 1989 | 233 | 387 | 724 | 1,344 | 2.36 | 1.65 | 2.84 | .58 |
| 1990 | 371 | 3 | 1,147 | 1,521 | 2.28 | 1.57 | 2.75 | .51 |
| 1991 | 113 | 0 | 987 | 1,100 | 2.37 | 1.62 | 2.75 | .41 |
| 1992 | 56 | 13 | 2,044 | 2,113 | 2.07 | 1.72 | 2.75 | .73 |
| 1993 | 45 | 119 | 686 | 850 | 2.50 | 1.72 | 2.75 | .28 |
| 1994 ³ | 43 | 150 | 1,465 | 1,658 | 2.00-2.40 | 1.89 | 2.75 | .57 |

Note: Crop year begins Sept. 1 for 1976-94, and Oct. 1 for 1965-75.

¹Grains stored under the Reseal Program for years 1965-72.

²Total may not add due to rounding.

³Projection as of Jan. 12, 1995.

⁴Actual loan rate; loan rate after Gramm-Rudman reduction is \$1.84 per bushel.

Source: Consolidated Farm Service Agency (CFSA), U.S. Dept. Agr.

World Agricultural Supply and Demand Estimates. U.S. Dept. Agr., WASDE-298, Jan. 12, 1995.

Appendix table 4--Program costs for corn, 1965-93

| Crop or fiscal year ¹ | Direct or deficiency | Diversion | Disaster | Storage | CCC operations | | |
|--|-------------------------|-----------|----------|---------|----------------|------------|-------------------|
| | | | | | Outlays | Redemption | Net expenditure |
| <i>Million dollars</i> | | | | | | | |
| 1965 | 334 | 760 | 0 | 0 | 1,382 | 696 | 659 |
| 1966 | 449 | 579 | 0 | 0 | 1,405 | 647 | 758 |
| 1967 | 429 | 302 | 0 | 0 | 1,402 | 550 | 852 |
| 1968 | 514 | 652 | 0 | 0 | 1,245 | 186 | 1,059 |
| 1969 | 585 | 780 | 0 | 0 | 1,795 | 304 | 1,491 |
| 1970 | 583 | 645 | 0 | 0 | 1,135 | 389 | 1,097 |
| 1971 | 893 | 0 | 0 | 0 | 1,358 | 510 | * 848 |
| 1972 | 1,144 | 325 | 0 | 0 | 1,911 | 489 | 1,422 |
| 1973 | 910 | 0 | 0 | 0 | 1,852 | 826 | 1,026 |
| 1974 | 0 | 0 | 244 | 0 | 1,051 | 607 | 444 |
| 1975 | 0 | 0 | 90 | 0 | 311 | 161 | 150 |
| 1976 | 0 | 0 | 181 | 0 | 251 | 139 | 112 |
| 1977 | 0 | 0 | 281 | 50 | 661 | 261 | 400 |
| 1978 | 88 | 558 | 37 | 173 | 2,778 | 1,081 | 1,697 |
| 1979 | 0 | 111 | 16 | 236 | 2,060 | 1,193 | 867 |
| 1980 | 0 | 0 | 280 | -72 | 2,072 | 816 | 1,256 |
| 1981 | 0 | 0 | 92 | 347 | 2,315 | 2,982 | -667 ³ |
| 1982 | 291 | 0 | 1 | 684 | 5,378 | 1,169 | 4,209 |
| 1983 ² | 0 | 905 | 0 | -22 | 6,533 | 813 | 5,720 |
| 1984 ² | 1,653 | 0 | 0 | 79 | 2,872 | 1,938 | -934 ³ |
| 1985 | 2,480 | 0 | 0 | 205 | 5,525 | 1,122 | 4,403 |
| 1986 | 6,195 | 133 | 0 | 519 | 10,994 | 470 | 10,524 |
| 1987 | 5,910 | 1,468 | 0 | 480 | 12,635 | 289 | 12,346 |
| 1988 | 2,163 | 562 | 997 | 275 | 10,459 | 2,232 | 8,227 |
| 1989 | 3,504 | 0 | 223 | 155 | 4,521 | 1,658 | 2,863 |
| 1990 | 3,014 | 0 | 32 | -2 | 3,992 | 1,557 | 2,435 |
| 1991 | 2,080 | 0 | 108 | 0 | 3,964 | 1,577 | 2,387 |
| 1992 | 3,625 | 0 | 156 | 0 | 3,696 | 1,591 | 2,105 |
| 1993 | 1,502 | 0 | 973 | 8 | 7,096 | 1,953 | 5,143 |

¹Crop year is used for program payments while fiscal year is used for CCC operations data.

²Includes PIK outlays.

³Negative net CCC expenditures imply loan redeemed in that year exceeded CCC outlays.

Source: Consolidated Farm Service Agency (CFSA), U.S. Dept. Agr.

Appendix table 5--Value comparisons for corn, 1965-94

| Crop year | Loan value/acre | | Market value/acre | | Gross value of production | | GNP deflator (1987=100) |
|-------------------|----------------------|---------------------|----------------------|---------------------|---------------------------|---------------------|----------------------------|
| | Nominal ¹ | \$1987 ² | Nominal ¹ | \$1987 ² | Nominal ³ | \$1987 ² | |
| | -----Dollars----- | | | | --Billion dollars -- | | Percent |
| 1965 | 77.8 | 275.9 | 86.0 | 304.8 | 4.8 | 16.9 | 28.2 |
| 1966 | 73.1 | 250.3 | 90.6 | 310.4 | 5.2 | 17.7 | 29.2 |
| 1967 | 84.1 | 280.4 | 82.5 | 275.0 | 5.0 | 16.7 | 30.0 |
| 1968 | 83.5 | 265.0 | 85.9 | 272.6 | 4.8 | 15.3 | 31.5 |
| 1969 | 90.2 | 271.7 | 99.6 | 300.1 | 5.4 | 16.4 | 33.2 |
| 1970 | 76.0 | 216.6 | 96.3 | 274.3 | 5.5 | 15.7 | 35.1 |
| 1971 | 92.5 | 249.3 | 95.2 | 256.5 | 6.1 | 16.4 | 37.1 |
| 1972 | 101.9 | 262.5 | 152.3 | 392.5 | 8.8 | 22.6 | 38.8 |
| 1973 | 95.9 | 232.1 | 232.8 | 563.7 | 14.5 | 35.0 | 41.3 |
| 1974 | 79.1 | 175.4 | 217.1 | 481.5 | 14.2 | 31.5 | 45.1 |
| 1975 | 95.0 | 192.0 | 219.5 | 443.4 | 14.8 | 30.0 | 49.5 |
| 1976 | 132.0 | 250.5 | 189.2 | 359.0 | 13.5 | 25.7 | 52.7 |
| 1977 | 181.6 | 323.1 | 183.4 | 326.4 | 13.1 | 23.4 | 56.2 |
| 1978 | 202.0 | 335.0 | 227.3 | 376.9 | 16.4 | 21.8 | 60.3 |
| 1979 | 230.0 | 350.5 | 271.6 | 414.0 | 19.7 | 30.0 | 65.6 |
| 1980 | 204.8 | 286.0 | 283.9 | 396.5 | 20.7 | 28.9 | 71.6 |
| 1981 | 261.4 | 333.8 | 269.0 | 343.5 | 20.1 | 25.6 | 78.3 |
| 1982 | 288.7 | 345.7 | 288.7 | 345.7 | 21.0 | 25.1 | 83.5 |
| 1983 | 214.9 | 247.3 | 260.3 | 299.6 | 13.4 | 15.4 | 86.9 |
| 1984 | 272.1 | 299.3 | 280.6 | 308.7 | 20.2 | 22.2 | 90.9 |
| 1985 | 300.9 | 263.1 | 263.1 | 278.8 | 19.8 | 21.0 | 94.4 |
| 1986 | 229.3 | 236.3 | 179.1 | 184.6 | 12.3 | 12.7 | 97.0 |
| 1987 | 218.0 | 218.0 | 232.4 | 232.4 | 13.8 | 13.8 | 100.0 |
| 1988 | 149.7 | 144.4 | 214.9 | 207.2 | 12.5 | 12.1 | 103.7 |
| 1989 | 191.9 | 176.5 | 274.5 | 252.5 | 17.8 | 16.3 | 108.7 |
| 1990 | 186.1 | 164.1 | 270.2 | 238.3 | 18.1 | 16.0 | 113.4 |
| 1991 | 175.9 | 150.2 | 257.4 | 219.8 | 17.7 | 15.1 | 117.1 |
| 1992 | 226.0 | 185.7 | 272.0 | 223.5 | 19.6 | 16.1 | 121.7 |
| 1993 | 173.2 | 139.2 | 251.8 | 202.4 | 15.9 | 12.7 | 124.4 |
| 1994 ⁴ | 262.0 | 205.3 | 304.9 | 239.0 | 22.2 | 17.4 | 127.6 |

Note: Crop year begins Sept. 1 for 1976-94, and Oct. 1 for 1965-75.

¹Loan rate or average farm price times yield per harvested acre.

²GNP implicit price deflator (1987 = 100) was used.

³Production times average farm price.

⁴Projection as of Jan. 12, 1995.

Source: Consolidated Farm Service Agency, U.S. Dept. Agr.

Appendix table 6--World production, consumption, exports, and ending stocks for corn, 1965-94

| Crop year ¹ | Production | Consumption | Exports ² | Ending stocks | Stocks-to use ratio |
|------------------------|---------------------------------|-------------|----------------------|---------------|---------------------|
| | ----- Million metric tons ----- | | | | Percent |
| 1965 | 225.5 | 234.9 | 27.3 | 33.7 | 14.4 |
| 1966 | 250.1 | 244.7 | 26.0 | 39.1 | 16.0 |
| 1967 | 262.2 | 254.1 | 28.6 | 47.1 | 18.5 |
| 1968 | 252.5 | 255.9 | 28.1 | 43.7 | 17.1 |
| 1969 | 270.0 | 272.7 | 29.2 | 41.1 | 15.1 |
| 1970 | 268.1 | 273.0 | 30.1 | 36.1 | 13.2 |
| 1971 | 308.5 | 295.6 | 34.5 | 49.0 | 16.6 |
| 1972 | 301.4 | 312.5 | 43.0 | 38.0 | 12.2 |
| 1973 | 330.5 | 329.8 | 51.9 | 38.7 | 11.7 |
| 1974 | 299.8 | 292.1 | 49.1 | 46.4 | 15.9 |
| 1975 | 339.2 | 332.7 | 57.2 | 53.0 | 15.9 |
| 1976 | 356.1 | 340.8 | 53.7 | 68.3 | 20.0 |
| 1977 | 365.4 | 356.5 | 60.9 | 77.3 | 21.7 |
| 1978 | 392.1 | 384.0 | 65.6 | 85.4 | 22.2 |
| 1979 | 425.3 | 412.4 | 73.9 | 98.4 | 23.9 |
| 1980 | 408.5 | 421.9 | 78.2 | 85.5 | 20.3 |
| 1981 | 441.4 | 417.8 | 67.3 | 109.1 | 26.1 |
| 1982 | 439.8 | 419.4 | 63.3 | 129.4 | 30.9 |
| 1983 | 347.8 | 411.0 | 61.1 | 66.3 | 16.1 |
| 1984 | 458.3 | 434.2 | 66.6 | 90.4 | 20.8 |
| 1985 | 478.5 | 424.0 | 54.5 | 144.9 | 34.2 |
| 1986 | 475.3 | 457.4 | 56.6 | 162.8 | 35.6 |
| 1987 | 450.5 | 467.2 | 56.7 | 148.5 | 31.8 |
| 1988 | 400.6 | 459.8 | 65.5 | 89.3 | 19.4 |
| 1989 | 460.6 | 477.3 | 74.4 | 72.7 | 15.2 |
| 1990 | 477.9 | 470.6 | 59.1 | 80.0 | 17.0 |
| 1991 | 486.9 | 486.0 | 62.6 | 80.9 | 16.7 |
| 1992 | 533.2 | 509.0 | 62.0 | 105.1 | 20.7 |
| 1993 | 467.5 | 503.8 | 55.5 | 68.9 | 13.7 |
| 1994 ³ | 555.9 | 536.2 | 64.1 | 88.6 | 16.5 |

¹Based on aggregate of differing local marketing years.

²Includes intra-EC trade during 1965-75, but excludes intra-EC trade during 1976-94.

³Forecast as of Jan. 12, 1995.

Source: For. Agr. Serv., U.S. Dept. Agr.

Appendix table 7--U.S. and world production, trade, and ending stocks of corn, 1970-94

| Crop year ¹ | Production | | | Exports | | | Ending stocks | | |
|------------------------|------------------------|---------------|----------------|------------------------|---------------|----------------|------------------------|---------------|----------------|
| | World | United States | U.S. share | World ² | United States | U.S. share | World | United States | U.S. share |
| | <i>Million bushels</i> | | <i>Percent</i> | <i>Million bushels</i> | | <i>Percent</i> | <i>Million bushels</i> | | <i>Percent</i> |
| 1970 | 10,554 | 4,152 | 39.3 | 1,266 | 506 | 40.0 | 1,423 | 663 | 46.6 |
| 1971 | 12,145 | 5,646 | 46.5 | 1,411 | 782 | 55.4 | 1,930 | 1,126 | 58.3 |
| 1972 | 11,867 | 5,580 | 47.0 | 1,768 | 1,242 | 70.2 | 1,497 | 708 | 47.3 |
| 1973 | 13,012 | 5,671 | 43.6 | 2,132 | 1,230 | 57.7 | 1,524 | 484 | 31.8 |
| 1974 | 11,802 | 4,701 | 39.8 | 1,847 | 1,149 | 62.2 | 1,828 | 558 | 30.5 |
| 1975 | 13,354 | 5,841 | 43.7 | 2,362 | 1,664 | 71.0 | 2,085 | 633 | 30.4 |
| 1976 | 14,020 | 6,289 | 44.9 | 2,114 | 1,645 | 78.8 | 2,690 | 1,136 | 42.2 |
| 1977 | 14,387 | 6,505 | 45.3 | 2,398 | 1,896 | 74.1 | 3,043 | 1,436 | 47.2 |
| 1978 | 15,438 | 7,268 | 47.1 | 2,583 | 2,113 | 82.2 | 3,362 | 1,710 | 50.9 |
| 1979 | 16,744 | 7,928 | 47.4 | 2,909 | 2,402 | 83.2 | 3,872 | 2,034 | 52.5 |
| 1980 | 16,084 | 6,639 | 41.3 | 3,079 | 2,391 | 77.7 | 3,366 | 1,392 | 41.4 |
| 1981 | 17,377 | 8,119 | 46.7 | 2,650 | 1,997 | 75.4 | 4,293 | 2,537 | 59.1 |
| 1982 | 17,313 | 8,235 | 47.6 | 2,492 | 1,821 | 73.1 | 5,095 | 3,523 | 69.1 |
| 1983 | 13,694 | 4,174 | 30.5 | 2,405 | 1,886 | 78.4 | 2,610 | 1,006 | 38.5 |
| 1984 | 18,041 | 7,672 | 42.5 | 2,622 | 1,850 | 70.6 | 3,558 | 1,648 | 46.3 |
| 1985 | 18,839 | 8,875 | 47.1 | 2,146 | 1,227 | 57.2 | 5,706 | 4,040 | 70.8 |
| 1986 | 18,710 | 8,226 | 44.0 | 2,228 | 1,492 | 67.0 | 6,410 | 4,882 | 76.2 |
| 1987 | 17,735 | 7,131 | 40.2 | 2,232 | 1,716 | 76.9 | 5,848 | 4,259 | 72.8 |
| 1988 | 15,769 | 4,929 | 31.3 | 2,579 | 2,026 | 78.6 | 3,516 | 1,930 | 54.9 |
| 1989 | 18,135 | 7,532 | 41.5 | 2,929 | 2,368 | 80.9 | 2,861 | 1,344 | 47.0 |
| 1990 | 18,814 | 7,934 | 42.2 | 2,327 | 1,725 | 74.1 | 3,149 | 1,521 | 48.3 |
| 1991 | 19,168 | 7,475 | 39.0 | 2,464 | 1,584 | 64.3 | 3,185 | 1,100 | 34.5 |
| 1992 | 20,991 | 9,477 | 45.2 | 2,752 | 1,663 | 60.4 | 4,138 | 2,113 | 51.1 |
| 1993 | 18,405 | 6,336 | 34.4 | 2,402 | 1,328 | 55.3 | 2,713 | 850 | 31.3 |
| 1994 ³ | 21,885 | 10,103 | 46.2 | 2,697 | 1,950 | 72.3 | 3,488 | 1,658 | 47.5 |

¹Based on aggregate of differing local marketing years.

²Includes intra-EC trade during 1970-75, but excludes intra-EC trade during 1976-94.

³Forecast as of Jan. 12, 1995.

Appendix table 8--Selected ratios: World corn trade, stocks, and consumption, 1965-94

| Crop year ¹ | World trade to world consumption ² | World stocks to world consumption | U.S. exports to foreign consumption |
|------------------------|---|-----------------------------------|-------------------------------------|
| | <i>Percent</i> | | |
| 1965 | 12.1 | 14.3 | 12.2 |
| 1966 | 11.1 | 16.0 | 8.1 |
| 1967 | 11.6 | 18.5 | 10.1 |
| 1968 | 10.5 | 17.1 | 8.5 |
| 1969 | 11.6 | 15.1 | 9.5 |
| 1970 | 11.9 | 13.2 | 7.6 |
| 1971 | 12.2 | 16.6 | 11.0 |
| 1972 | 14.5 | 12.2 | 16.6 |
| 1973 | 16.5 | 11.7 | 15.0 |
| 1974 | 16.1 | 15.9 | 14.3 |
| 1975 | 18.1 | 15.9 | 18.8 |
| 1976 | 15.9 | 20.1 | 18.1 |
| 1977 | 17.2 | 21.7 | 19.8 |
| 1978 | 17.1 | 22.2 | 20.8 |
| 1979 | 17.9 | 23.9 | 21.8 |
| 1980 | 18.8 | 20.3 | 21.0 |
| 1981 | 16.0 | 26.1 | 17.3 |
| 1982 | 14.9 | 30.9 | 16.1 |
| 1983 | 15.0 | 16.1 | 16.9 |
| 1984 | 15.3 | 20.8 | 15.6 |
| 1985 | 12.8 | 34.2 | 10.8 |
| 1986 | 12.3 | 35.6 | 12.4 |
| 1987 | 12.2 | 31.8 | 14.3 |
| 1988 | 14.3 | 19.4 | 15.5 |
| 1989 | 15.6 | 15.2 | 18.0 |
| 1990 | 12.6 | 17.0 | 14.0 |
| 1991 | 12.9 | 16.6 | 12.5 |
| 1992 | 13.7 | 20.6 | 12.6 |
| 1993 | 13.1 | 13.7 | 9.8 |
| 1994 ³ | 12.5 | 16.5 | 14.2 |

¹Based on aggregate of differing local marketing years.

²Includes intra-EC trade during 1965-75, but excludes intra-EC trade during 1976-94.

³Forecast as of Jan. 12, 1995.

Source: For. Agr. Serv., U.S. Dept. Agr.

Appendix table 9--Corn production and exports, major foreign exporters and total foreign, 1970-94

| Crop year | Argentina | | South Africa | | Thailand | | China | | Total foreign | |
|------------------------|------------|----------------------|--------------|----------------------|------------|----------------------|------------|----------------------|---------------|----------------------|
| | Production | Exports ¹ | Production | Exports ¹ | Production | Exports ¹ | Production | Exports ¹ | Production | Exports ² |
| <i>Million bushels</i> | | | | | | | | | | |
| 1970 | 391 | 254 | 339 | 101 | 76 | 66 | 1,300 | 1 | 6,411 | 760 |
| 1971 | 231 | 100 | 374 | 140 | 91 | 83 | 1,411 | 12 | 6,508 | 629 |
| 1972 | 354 | 185 | 164 | 6 | 52 | 41 | 1,264 | 8 | 6,302 | 527 |
| 1973 | 390 | 225 | 437 | 127 | 93 | 84 | 1,521 | 6 | 7,349 | 902 |
| 1974 | 303 | 137 | 358 | 126 | 98 | 78 | 1,690 | 9 | 7,110 | 698 |
| 1975 | 231 | 128 | 288 | 58 | 113 | 94 | 1,859 | 9 | 7,525 | 685 |
| 1976 | 327 | 206 | 383 | 99 | 105 | 83 | 1,896 | 5 | 7,722 | 719 |
| 1977 | 382 | 233 | 396 | 119 | 66 | 48 | 1,944 | 3 | 7,868 | 675 |
| 1978 | 354 | 235 | 328 | 92 | 110 | 82 | 2,202 | 2 | 8,158 | 675 |
| 1979 | 252 | 135 | 424 | 136 | 130 | 85 | 2,363 | 3 | 8,806 | 659 |
| 1980 | 508 | 358 | 577 | 195 | 126 | 84 | 2,464 | 5 | 9,444 | 949 |
| 1981 | 378 | 227 | 329 | 149 | 171 | 128 | 2,331 | 4 | 9,251 | 874 |
| 1982 | 354 | 238 | 161 | 9 | 136 | 84 | 2,384 | 2 | 9,068 | 761 |
| 1983 | 374 | 215 | 173 | 0 | 156 | 112 | 2,685 | 13 | 9,506 | 761 |
| 1984 | 469 | 281 | 320 | 20 | 171 | 125 | 2,890 | 206 | 10,386 | 1,008 |
| 1985 | 488 | 290 | 318 | 114 | 211 | 145 | 2,513 | 252 | 10,012 | 1,207 |
| 1986 | 364 | 159 | 282 | 57 | 170 | 115 | 2,789 | 150 | 10,514 | 936 |
| 1987 | 354 | 171 | 280 | 24 | 108 | 32 | 3,120 | 176 | 10,574 | 885 |
| 1988 | 197 | 71 | 488 | 157 | 165 | 61 | 3,045 | 158 | 10,893 | 911 |
| 1989 | 205 | 110 | 350 | 39 | 161 | 46 | 3,107 | 121 | 10,629 | 785 |
| 1990 | 299 | 157 | 327 | 35 | 150 | 47 | 3,812 | 271 | 10,877 | 856 |
| 1991 | 417 | 239 | 122 | 0 | 142 | 23 | 3,888 | 393 | 11,692 | 1,106 |
| 1992 | 402 | 187 | 393 | 47 | 134 | 6 | 3,755 | 497 | 11,514 | 1,087 |
| 1993 | 394 | 177 | 507 | 187 | 114 | 5 | 4,043 | 453 | 12,069 | 1,270 |
| 1994 ³ | 413 | 195 | 315 | 39 | 150 | 8 | 4,094 | 197 | 11,782 | 746 |

¹Based on local marketing year.²Includes intra-EU trade.³Forecast as of Jan. 12, 1995.

Source: For. Agr. Serv., U.S. Dept. Agr.

Appendix table 10--Production, use and ending stocks for sorghum, 1965-94

| Crop year | Production | Feed and residual | Food, seed, and industrial | | Exports | Total use ¹ | Ending stocks | Stocks-to-use ratio |
|---------------------------|------------|-------------------|----------------------------|-----|---------|------------------------|---------------|---------------------|
| | | | | | | | | |
| -----Million bushels----- | | | | | | | | Percent |
| 1965 | 673 | 568 | 13 | 266 | 847 | 391 | 46.2 | |
| 1966 | 715 | 601 | 13 | 248 | 862 | 244 | 28.3 | |
| 1967 | 755 | 531 | 13 | 166 | 710 | 289 | 40.7 | |
| 1968 | 731 | 614 | 13 | 106 | 733 | 287 | 39.2 | |
| 1969 | 730 | 638 | 9 | 126 | 773 | 244 | 31.6 | |
| 1970 | 683 | 680 | 12 | 144 | 836 | 91 | 10.9 | |
| 1971 | 868 | 681 | 13 | 123 | 817 | 142 | 17.4 | |
| 1972 | 801 | 648 | 10 | 212 | 870 | 73 | 8.4 | |
| 1973 | 923 | 690 | 11 | 234 | 935 | 61 | 6.5 | |
| 1974 | 623 | 425 | 12 | 212 | 649 | 35 | 5.4 | |
| 1975 | 754 | 498 | 11 | 229 | 738 | 82 | 11.1 | |
| 1976 | 711 | 411 | 11 | 254 | 676 | 117 | 17.3 | |
| 1977 | 781 | 448 | 11 | 223 | 682 | 216 | 31.7 | |
| 1978 | 731 | 538 | 12 | 190 | 740 | 208 | 28.1 | |
| 1979 | 807 | 495 | 12 | 330 | 837 | 178 | 21.3 | |
| 1980 | 579 | 323 | 11 | 293 | 627 | 130 | 20.8 | |
| 1981 | 876 | 417 | 11 | 260 | 688 | 319 | 46.3 | |
| 1982 | 835 | 495 | 10 | 210 | 715 | 439 | 61.4 | |
| 1983 | 488 | 385 | 10 | 245 | 639 | 288 | 45.0 | |
| 1984 | 866 | 539 | 17 | 297 | 854 | 300 | 35.2 | |
| 1985 | 1,120 | 664 | 28 | 178 | 870 | 551 | 63.4 | |
| 1986 | 939 | 536 | 12 | 198 | 747 | 743 | 99.6 | |
| 1987 | 731 | 555 | 25 | 232 | 811 | 663 | 81.7 | |
| 1988 | 577 | 466 | 22 | 311 | 800 | 440 | 55.0 | |
| 1989 | 615 | 517 | 15 | 303 | 835 | 220 | 26.3 | |
| 1990 | 573 | 410 | 8 | 232 | 651 | 143 | 21.9 | |
| 1991 | 585 | 374 | 9 | 292 | 674 | 53 | 7.9 | |
| 1992 | 875 | 469 | 8 | 277 | 753 | 175 | 23.2 | |
| 1993 | 534 | 453 | 8 | 202 | 662 | 48 | 7.3 | |
| 1994 ² | 655 | 400 | 8 | 220 | 628 | 75 | 11.9 | |

Note: Crop year begins Sept. 1 for 1976-94, and Oct. 1 for 1965-75.

¹Total may not add due to rounding.

²Projection as of Jan. 12, 1995.

Source: *Feed Situation and Outlook Report*. U.S. Dept. Agr., Econ. Res. Serv., various issues.

Appendix table 11--Prices and ending stocks for sorghum, 1965-94

| Crop year | Ending stocks | | | | Price received | Loan rate | Target price | Direct payment ⁴ |
|---------------------------|---------------|------------------|------|------------------------------|----------------|-------------------|--------------|-----------------------------|
| | CCC | FOR ¹ | Free | Total ² | | | | |
| -----Million bushels----- | | | | -----Dollars per bushel----- | | | | |
| 1965 | 383 | 0 | 8 | 391 | .99 | .92 | 1.12 | 0.35 |
| 1966 | 193 | 0 | 51 | 244 | 1.02 | .85 | 1.15 | .53 |
| 1967 | 192 | 0 | 97 | 289 | .99 | .90 | 1.20 | .53 |
| 1968 | 198 | 0 | 89 | 287 | .95 | .90 | 1.20 | .53 |
| 1969 | 156 | 0 | 88 | 244 | 1.07 | .90 | 1.20 | .53 |
| 1970 | 65 | 0 | 26 | 91 | 1.14 | .90 | 1.20 | .53 |
| 1971 | 45 | 0 | 97 | 142 | 1.04 | .97 | 1.24 | .52 |
| 1972 | 5 | 0 | 68 | 73 | 1.37 | 1.00 | 1.34 | .68 |
| 1973 | 0 | 0 | 61 | 61 | 2.14 | 1.00 | 1.46 | .54 |
| 1974 | 0 | 0 | 35 | 35 | 2.77 | 1.05 | 1.31 | -- |
| 1975 | 0 | 0 | 82 | 82 | 2.36 | 1.05 | 1.31 | -- |
| 1976 | 5 | 0 | 112 | 117 | 2.03 | 1.43 | 1.49 | -- |
| 1977 | 5 | 32 | 179 | 216 | 1.82 | 1.90 | 2.28 | -- |
| 1978 | 44 | 51 | 113 | 208 | 2.01 | 1.90 | 2.28 | .33 |
| 1979 | 46 | 18 | 114 | 178 | 2.35 | 2.00 | 2.34 | .13 |
| 1980 | 41 | 0 | 89 | 130 | 2.91 | 2.14 | 2.50 | -- |
| 1981 | 42 | 229 | 48 | 319 | 2.25 | 2.28 | 2.55 | .27 |
| 1982 | 171 | 313 | -45 | 439 | 2.47 | 2.42 | 2.60 | .18 |
| 1983 | 103 | 179 | 6 | 288 | 2.74 | 2.52 | 2.72 | -- |
| 1984 | 112 | 130 | 58 | 300 | 2.32 | 2.42 | 2.88 | .46 |
| 1985 | 207 | 75 | 269 | 551 | 1.93 | 2.42 | 2.88 | .46 |
| 1986 | 409 | 93 | 241 | 743 | 1.37 | 1.82 ⁵ | 2.88 | 1.06 |
| 1987 | 464 | 70 | 149 | 663 | 1.70 | 1.74 | 2.88 | 1.14 |
| 1988 | 341 | 28 | 72 | 440 | 2.27 | 1.68 | 2.78 | .48 |
| 1989 | 163 | 12 | 45 | 220 | 2.10 | 1.57 | 2.70 | .66 |
| 1990 | 65 | 0 | 78 | 143 | 2.12 | 1.49 | 2.61 | .56 |
| 1991 | 8 | 0 | 45 | 53 | 2.25 | 1.54 | 2.61 | .37 |
| 1992 | 4 | 1 | 170 | 175 | 1.89 | 1.63 | 2.61 | .72 |
| 1993 | 1 | 4 | 43 | 48 | 2.31 | 1.63 | 2.61 | .25 |
| 1994 ³ | 1 | 10 | 64 | 75 | 1.85-2.25 | 1.80 | 2.61 | .59 |

Note: Crop year begins Sept. 1 for 1976-94, and Oct. 1 for 1965-75.

¹Grains stored under the Reseal Program for years 1965-72.

²Total may not add due to rounding.

³Projection as of Jan. 12, 1995.

⁴Price support 1965-71; set aside 1972-73; deficiency payment 1974-94.

⁵Actual loan rate; loan rate after Gramm-Rudman reduction is \$1.74 per bushel.

Source: Consolidated Farm Service Agency (CFSA), U.S. Dept. Agr.

Appendix table 12--Program costs for sorghum, 1965-93

| Crop or fiscal year ¹ | Direct or deficiency | Diversion | Disaster | Storage | CCC operations | | |
|--|-------------------------|-----------|----------|---------|----------------|------------|------------------|
| | | | | | Outlays | Redemption | Net expenditure |
| <i>Million dollars</i> | | | | | | | |
| 1965 | 80 | 145 | 0 | -- | 382 | 180 | 202 |
| 1966 | 116 | 104 | 0 | -- | 401 | 289 | 113 |
| 1967 | 114 | 23 | 0 | -- | 344 | 401 | -57 ³ |
| 1968 | 114 | 89 | 0 | -- | 198 | 33 | 166 |
| 1969 | 119 | 114 | 0 | -- | 316 | 43 | 273 |
| 1970 | 129 | 108 | 0 | -- | 197 | 44 | 153 |
| 1971 | 167 | 0 | 0 | -- | 166 | 52 | 115 |
| 1972 | 220 | 69 | 0 | -- | 285 | 70 | 216 |
| 1973 | 183 | 0 | 0 | -- | 273 | 107 | 166 |
| 1974 | 0 | 0 | 68 | -- | 168 | 23 | 144 |
| 1975 | 0 | 0 | 20 | -- | 66 | 8 | 59 |
| 1976 | 0 | 0 | 34 | -- | 28 | 7 | 22 |
| 1977 | 138 | 0 | 30 | 12 | 156 | 17 | 139 |
| 1978 | 181 | 25 | 37 | 14 | 572 | 184 | 388 |
| 1979 | 63 | 23 | 13 | 12 | 407 | 217 | 190 |
| 1980 | 0 | 0 | 101 | -6 | 235 | 167 | 68 |
| 1981 | 233 | 0 | 30 | 74 | 218 | 114 | 104 |
| 1982 | 64 | 0 | 3 | 112 | 1,073 | 85 | 989 |
| 1983 ² | 0 | 110 | 0 | 59 | 862 | 48 | 814 |
| 1984 ² | 158 | 0 | 0 | 35 | 176 | 101 | 76 |
| 1985 | 226 | 0 | 0 | 21 | 530 | 67 | 463 |
| 1986 | 556 | 13 | 0 | 32 | 1,215 | 30 | 1,185 |
| 1987 | 576 | 133 | 0 | 28 | 1,208 | 5 | 1,203 |
| 1988 | 262 | 59 | 30 | 11 | 899 | 135 | 764 |
| 1989 | 390 | 0 | 53 | 5 | 551 | 84 | 467 |
| 1990 | 317 | 0 | 10 | 0 | 386 | 36 | 349 |
| 1991 | 175 | 0 | 16 | 0 | 273 | 30 | 243 |
| 1992 | 328 | 0 | 6 | 0 | 216 | 26 | 190 |
| 1993 | 150 | 0 | 46 | 0 | 464 | 54 | 410 |

¹Crop year is used for program payments while fiscal year is used for CCC operations data.

²Includes PIK outlays.

³Negative net CCC expenditures imply loan redeemed in that year exceeded CCC outlays.

Source: Consolidated Farm Service Agency (CFSA), U.S. Dept. Agr.